^{109}Ag(^{82}Kr,2nγ),(^{83}Kr,3nγ) 2004Hu15,2002Hu14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Aug-2021

Includes ^{142}Nd(^{52}Cr,p4nγ),E=239-307 MeV from 2001An11, where 357-keV isomer in ^{189}Bi was identified through recoils-α-γ correlated decay curve.

2004Hu15 (also 2007DoZW): E=340 MeV. Measured Eγ, Iγ, $\gamma\gamma$ with the Jurosphere II array comprised of 27 Compton-suppressed HPGe detectors. Delayed γ-rays were detected at the RITU focal plane with a HPGe detector, which was replaced by a more efficient setup of BGO detectors for the ^{109}Ag(^{83}Kr,3nγ) experiment. The fusion-evaporation residues were selected by the gas-filled separator RITU and identified event by event using their α-decay characteristics in order to apply the Recoil Decay Tagging (RDT) technique.

2004Hu15 state that many γ transitions were also observed in coin with the α decay of the 1/2$^+$ isomer of ^{189}Bi, but no levels could be established due to the lack of counting statistics and $\gamma\gamma$ coincidences.

2002Hu14: ^{109}Ag(^{82}Kr,2nγ),^{109}Ag(^{83}Kr,3nγ),E=337 MeV; Position sensitive detectors; Jurosphere II array of Ge detectors, Ge detector with a BGO wall; Recoil decay tagging technique. Measured half-life of the 13/2$^+$ isomer.

2001An11: ^{142}Nd(^{52}Cr,p4nγ),E=239-307 MeV. Identified isomer in ^{189}Bi at 357 keV and measured its half-life by recoils-α-γ(t) using velocity filter SHIP at GSI facility.

The data are from 2004Hu15 and 2002Hu14 unless otherwise stated.

^{189}Bi Levels

E(level)	J$^\pi$[†]	T$_{1/2}$	Comments
0	9/2$^-$		
357	13/2$^+$	886 ns *32*	%IT=100 T$_{1/2}$: weighted average of 888 ns *32* (2007DoZW, recoils-α-γ correlation decay curve); 880 ns *50* (2002Hu14, 357γ(t), note that units of ms in Fig. 2 and text of 2004Hu15 are misprints). Other: ≥360 ns *120* (2001An11, recoils-α-γ(t) in ^{142}Nd(^{52}Cr,p4nγ),E=239-307 MeV).
777[‡]	17/2$^+$		
1090[‡]	21/2$^+$		
1465[‡]	25/2$^+$		
1911[‡]	(29/2$^+$)		
2421[‡]	(33/2$^+$)		
2972[‡]	(37/2$^+$)		

[†] As assigned in 2004Hu15 based on systematics of neighboring nuclei for the g.s. and 13/2$^+$ isomer, and from band structure and limited $\gamma(\theta)$ data for higher levels. All assignments are given in parentheses in Adopted Levels.

[‡] Band(A): Band based on 17/2$^+$. Band built on $\pi i_{13/2}$ intruder orbital.

γ(^{189}Bi)

E$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[#]	Comments
[x]180							
[x]239							
313	1090	21/2$^+$	777	17/2$^+$	[†]		
[x]337[‡]							
[x]348[‡]							
357	357	13/2$^+$	0	9/2$^-$	M2	0.969	α(K)=0.738; α(L)=0.175; α(M)=0.0429; α(N)=0.01105 Mult.: from α(K)exp=0.9 *1* (2001An11, from number of K-x rays and γ rays from the decay of the isomer populated in ^{142}Nd(^{52}Cr,p4nγ)).
375	1465	25/2$^+$	1090	21/2$^+$	[†]		

Continued on next page (footnotes at end of table)

^{109}Ag(^{82}Kr,2nγ),(^{83}Kr,3nγ) 2004Hu15,2002Hu14 (continued)

γ(^{189}Bi) (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	E_γ	E_i(level)	J_i^π	E_f	J_f^π
420	777	$17/2^+$	357	$13/2^+$		510	2421	$(33/2^+)$	1911	$(29/2^+)$
446	1911	$(29/2^+)$	1465	$25/2^+$	†	551	2972	$(37/2^+)$	2421	$(33/2^+)$
x450						x628‡				
x463										

† Assigned as ΔJ=2, E2 in 2004Hu15 based on γ(θ) data; but no details of the γ(θ) are provided in the paper.
‡ Transition feeds the $13/2^+$ isomer.
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
x γ ray not placed in level scheme.

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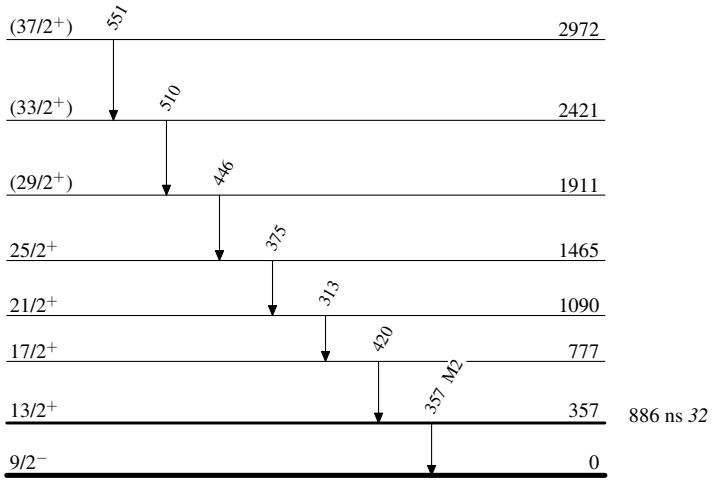
Level Scheme



$^{189}_{83}Bi_{106}$

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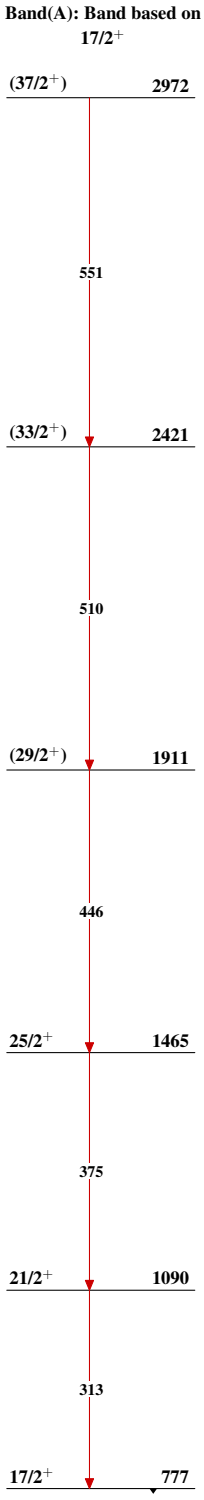

$^{189}_{83}Bi_{106}$